

**What is claimed is:**

1. A slurry composition for chemical and mechanical polishing comprising:  
a dispersion comprising an abrasive,  
wherein said dispersion has a large particle count of between about 25 to about 150,000 particles having a particle size of greater than about 0.5  $\mu\text{m}$  in a 30  $\mu\text{L}$  sample.
2. The composition of claim 1, wherein said large particle count is between about 500 to about 150,000 particles having a particle size of greater than about 0.5  $\mu\text{m}$  in a 30  $\mu\text{L}$  sample.
3. The composition of claim 2, wherein said large particle count is between about 1,000 to about 6,000 particles having a particle size of greater than about 0.5  $\mu\text{m}$  in a 30  $\mu\text{L}$  sample.
4. The composition of claim 1, wherein said dispersion is at least one selected from the group consisting of: fumed silica, colloidal silica, alumina, ceria, and mixtures thereof.
5. The composition of claim 4, wherein said dispersion is a fumed silica dispersion.
6. The composition of claim 5, wherein said fumed silica dispersion has a fumed silica concentration of between about 1 wt.% to about 25 wt. %, based on the total weight of said dispersion.
7. The composition of claim 1, further comprising an oxidizer.

8. The composition of claim 7, wherein said oxidizer is at least one selected from the group consisting of: hydrogen peroxide, potassium ferricyanide, potassium dichromate, potassium iodate, potassium bromate, vanadium trioxide, hypochlorous acid, sodium hypochlorite, potassium hypochlorite, calcium hypochlorite, magnesium hypochlorite, ferric nitrate, ammonium salts, ammonium persulfate, potassium permanganate, and mixtures thereof.

9. The composition of claim 7, wherein said oxidizer is present in an amount between about 0.05% to about 10%, based on the total weight of the slurry composition.

10. The composition of claim 8, wherein said oxidizer is hydrogen peroxide.

11. The composition of claim 10, wherein said hydrogen peroxide is present in an amount between about 0.05 % to about 0.5 %, based on the total weight of the slurry composition.

12. The composition of claim 1, further comprising a corrosion inhibitor.

13. The composition of claim 12, wherein said corrosion inhibitor is at least one selected from the group consisting of: benzotriazole, 6-tolylytriazole, 1-(2,3,dicarboxypropyl)benzotriazole, carboxylic acids, and mixtures thereof.

14. The composition of claim 13, wherein said corrosion inhibitor is present in amount between about 0.003% to about 1%, based on the total weight of the slurry composition.

15. The composition of claim 13, wherein said corrosion inhibitor is benzotriazole.

16. The composition of claim 15, wherein said benzotriazole is present in an amount between about 0.005 % to about 0.15 %, based on the total weight of the slurry composition.

17. The composition of claim 1, further comprising a chemical activity enhancer, which increases a copper removal rate of the slurry composition.

18. The composition of claim 17, wherein said chemical activity enhancer is an amine, which is selected from the group consisting of: ammonia, hydroxylamine, monoethanolamine, diethanolamine, triethanolamine, diethyleneglycolamine, N-hydroxyethylpiperazine, and mixtures thereof.

19. The composition of claim 18, wherein said amine is present in an amount between about 0.005% to about 10%, based on the total weight of the slurry composition.

20. The composition of claim 18, wherein said chemical activity enhancer is ammonia.

21. The composition of claim 20, wherein said ammonia is present in an amount between about 0.01 % to about 0.03 %, based on the total weight of the slurry composition.

22. The composition of claim 17, wherein said chemical activity enhancer is a complexing agent selected from the group consisting of: glycine, citric acid, carboxylic acid, amine, and any combinations thereof.

23. The composition of claim 1, further comprising a pH adjuster.

24. The composition of claim 23, wherein said pH adjuster is selected from the group consisting of: formic acid, acetic acid, propanoic acid, citric acid, malonic acid, butanoic acid, pentanoic acid, hexanoic acid, heptanoic acid, octanoic acid, nonanoic acid, lactic acid, hydrochloric acid, nitric acid, phosphoric acid, sulfuric acid, hydrofluoric acid, malic acid, tartaric acid, gluconic acid, citric acid, phthalic acid, pyrocatechoic acid, pyrogallol carboxylic acid, gallic acid, tannic acid and mixtures thereof.

25. The composition of claim 24, wherein said pH adjuster is present in an amount between about 0.10 % to about 2%, based on the total weight of the slurry.

26. The composition of claim 24, wherein said pH adjuster is propanoic acid.

27. The composition of claim 26, wherein said propanoic acid is present in an amount between about 0.1% to about 0.5%, based on the total weight of the slurry composition.

28. The composition of claim 1, wherein said slurry composition has a pH in the range of between about 3 to about 10.5.

29. The composition of claim 1, further comprising at least one additional chemical component selected from the group consisting of:

stabilizing agents, surfactants, fluorine-containing compounds, chelating agents, salts, and mixtures thereof.

30. A slurry composition for the chemical mechanical polishing of metal layers, the composition comprising:

- (a) a silica dispersion;
- (b) an oxidizer;
- (c) a chemical activity enhancer;
- (d) a pH adjuster; and
- (e) a corrosion inhibitor,

wherein said silica dispersion has a large particle count of between about 25 to about 150,000 particles having a particle size greater than about 0.5 $\mu$ m in a 30  $\mu$ L sample.

31. The composition of claim 30, wherein said large particle count is between about 500 to about 150,000 particles having a particle size of greater than about 0.5  $\mu$ m in a 30  $\mu$ L sample.

32. The composition of claim 31, wherein said large particle count is between about 1,000 to about 6,000 particles having a particle size of greater than about 0.5  $\mu$ m in a 30  $\mu$ L sample.

33. A method of preparing a chemical mechanical polishing slurry composition, comprising the steps of:

- (a) admixing a chemical mechanical polishing slurry composition comprising:  
a silica dispersion and an oxidizer; and
- (b) filtering said chemical mechanical polishing slurry composition such that the large particle count in said composition is between about 25 to about 150,000 particles

having a particle size greater than about 0.5  $\mu\text{m}$  in about 30  $\mu\text{L}$  of sample.

34. The method of claim 33, wherein said large particle count is between about 500 to about 150,000 particles having a particle size of greater than about 0.5  $\mu\text{m}$  in a 30  $\mu\text{L}$  sample.

35. The method of claim 34, wherein said large particle count is between about 1,000 to about 6,000 particles having a particle size of greater than about 0.5  $\mu\text{m}$  in a 30  $\mu\text{L}$  sample.

36. The method of claim 33, wherein said slurry composition is filtered at least once prior to its use.

37. The method of claim 36, wherein said slurry composition is filtered at least three times prior to its use.

38. The method of claim 33, wherein said large particle count is achieved during the manufacturing of the composition or just prior to chemical mechanical polishing.